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Safety Education for Children Cannot Stop for a Pandemic: Transitioning an Injury Prevention Program to a Virtual Format

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Abstract
In-person safety programs for pre-kindergarten children were not able to go on in their usual way during the summer of 2020 due to the Covid-19 pandemic. While some communities opted to cancel the programs, one organization in Northwest Ohio chose to reformat it, knowing that this education is a critical introduction to lifelong safety habits. Through social media, video-taped education from community safety professionals, and activity packets given to registrants, "Safety City" was able to go on. The new format incorporated all of the childhood safety topics normally presented in the live version of the program. The efforts described here indicate that it is feasible to alter presentation formats from in-person to virtual to connect even young children with important education. As such, similar programs needing to make this transition while the world continues to adjust to pandemic precautions may benefit from understanding the strengths, limitations, and insights from the process.

Keywords Pre-school children · Injury prevention · Virtual · Safety city · Safety education

Across the United States, summertime in-person safety education has become a rite of passage for many children just before they enter kindergarten. It is known by a variety of names—Safety Town, Safety City, Safety Land—but the underlying curriculum is the same, to introduce children to the dangers of the world and help them begin to learn strategies to maintain safety in the face of those dangers. The first Safety Town originated in Ohio in the 1930s; similar programs have expanded across the country over the years (National Safety Town Center, 2021). Parents are encouraged to have their incoming kindergartners (ages 4–6) attend this free community program. Primary topics are safety measures related to fire, walking/biking, water, and strangers, and may include others, such as safety about prescription drugs, guns, dogs, and bullying. The format for the program can vary, but always includes in-person interactive experiences. Sessions involve education through games, snacks, crafts, music, guest speakers, such as fire fighters and police officers, and outdoor activities in a mini-city with streets, sidewalks, crosswalks, and train crossings. Children participate in play-learning, taking turns being "motorists," "cyclists," and pedestrians. At the end of the program, participants "graduate" and are encouraged to share their new knowledge. While some research disputes the long-term effectiveness of these types of pre-school safety education programs (Luria et al., 2000; Orton et al., 2016), other research has shown that they are effective at increasing safety knowledge (McLaughlin et al., 2019; Morrongiello et al., 2016; Schaeffer et al., 2017). It is generally accepted that these are important introductory programs, as so many children get their first exposure to these topics through them.

Needs Assessment

The Covid-19 pandemic prompted communities to cancel their in-person pre-kindergarten safety education programs during the summer of 2020. Instead, safety was focused on social distancing, isolating, and altering normal activities in efforts to slow the spread of the virus. The police department of one large city in Northwest Ohio, with a population just under 270,000, has held "Safety City" programs annually

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for 41 years, until 2020, when they made the difficult decision to cancel in the best interests of community health. Many other programs across the county followed suit. One local hospital's Injury Prevention and Community Outreach Department (the lead agency for the Safe Kids Worldwide local coalition) took up the mantle to create an alternative, so area pre-kindergarten children would not miss out completely on this important introduction to safety education.

Planning

In June 2020, as pre-kindergarten safety education program cancellations were announced, a few injury prevention specialists initially planned to post some safety videos to Facebook to make up for the lack of formal education that summer. They reviewed YouTube videos and decided to also make videos of their own. While discussing various topics to include, the idea emerged to truly make this a replacement for the standard community pre-kindergarten safety program. They researched similar programs across the U.S. since the online platform would allow them to present a wider variety of topics. They made sure to incorporate information that the local programs would normally offer.

With only five weeks to pull this together, they had a lot of work to do. They first contacted community members across the county who were normally involved in these programs, most of whom were local Safe Kids Coalition members. Many were regular guest speakers or supporters of the local programs, and were happy to provide information and make videos if needed. Multiple police and fire departments from around the area responded, as well as the local zoo, YMCA, trauma department of a Level II pediatric trauma center, a gas company, a bicycle recycling and education center, the U.S. Coast Guard, and a school transportation department.

Once it was clear they would have the necessary involvement of community partners, they designed a Google registration form which asked parents to provide email and phone number, child's name, age, and school attending in the fall. Then they settled on incentives to get people to register—bike helmets and activity packets for all registered children, and one child would win a new bicycle. The next dilemma was getting details of the program out to parents and caregivers. They posted information and the registration link for "Virtual Safety City" on their Facebook page. Numerous individuals and organizations shared and re-shared the post. Coalition and community partners were asked to spread the word by posting information on their social media accounts as well. To maximize their reach, the institution's media department contacted a local television station; they filmed a story about the program's altered format, ran it three times, and posted it to their website. In the first 24 h of the registration form being open, more than 100 children were registered, with a final total of 390.

With partnerships and registrations established, it was time to settle on exact topics, and who would be asked to present each item. Some partners chose their topics, others were comfortable being assigned a topic. For example, one town's police department had a new building, so they were chosen for the video walkthrough of a police department. Some, like the Coast Guard, chose to shoot their own videos and submit them. Others opted to have the Injury Prevention team come to them to tour their facilities and make the videos. Fortunately, there was a decrease in Covid cases when videos were being filmed. Community partners were cautious, but not resistant to the organizers visiting their locations for filming. Safety standards were maintained, including social distancing, masking, handwashing/sanitizing, as well as any other safety measures requested, such as temperature checks. Some presenters chose to speak without masks for their videos, and social distancing was stressed at these times. After all the community videos were complete, gap areas were filled in with publicly available children's videos on other safety topics, or to reinforce some of the topics presented as live local videos.

During the presentation week, the team assembled 400 educational activity packets to distribute along with bike helmets to each child that registered for the program. The packets included a variety of items: stickers, coloring books/pages, watercolor paint page, door hanger, temporary tattoos, bookmarks, reflective bracelets, crayons, pencils, educational pamphlets for parents, and an early reader book: *Clifford Takes a Walk*, written by Norman Bridwell, published by Scholastic. Topics included a visit to a police station and safety related to walking, rollerblading, skateboarding, cycling, cars, trains, water, and fire. Particularly useful items were a plastic reflector that could be attached to a coat or backpack, and a window cling designed to show the internal temperature of a car.

Distribution sites were worked out during this time as well. To accommodate families from the greater metropolitan area, as well as the smaller outlying suburbs and towns, the team scheduled ten sites throughout the area, some at normal "Safety City" sites, others determined by registrants' zip codes. Dates and times were scheduled throughout the week following the virtual program, including one on Saturday for those who could not make it on a weekday.

Implementation

The format for the virtual presentations utilized Facebook and Instagram, with videos uploaded to the Safe Kids Worldwide local coalition pages. To imitate regular in-person pre-kindergarten safety education programs, a set

week was announced, and videos were released every other hour starting at 9:00 AM, grouping like topics together. Forty videos were released during the chosen week, half of which were locally recorded; the other half were supplemental. Average length of the videos was 5 min and twenty seconds. There was no requirement for children to watch at the time the videos were released, and the videos remain on the sites indefinitely. The process of doing this over the course of one week and gradually allowing access to different topics was meant to make the program feel more "live." Additionally, members of the team that created the program frequently reviewed comments or questions about the videos, and responded to them in as close to real time as they could.

Another Google form was released to parents to sign up for a packet distribution/helmet fitting event, but it was not successful; few completed it. Two hundred participants did attend these events, however. Pandemic safety measures were again encouraged and followed as much as possible. Parents were given the option of having staff talk them through fitting their child's helmet from a safe distance, or allowing staff to do it. If staff fitted the child, face-to-face interaction was minimized by having the child face away from the fitter, who was wearing a mask. Hand sanitizer was used before and after each child. Concerns about the virus may be partially to blame for the lower turn-out. It is worth noting that none of the organizers contracted Covid-19, nor did they hear from community partners, families, or the health department that anyone associated with these events became sick as a result.

Finally, the winner of the new bicycle was chosen from the list of pre-registered children using a random number generator. The parent was notified by phone, and the injury prevention specialists met the family at a local department store. The child was allowed to choose from a group of bicycles that were the appropriate size. No public announcement was made of the winner due to the parent's request to remain anonymous.

Evaluation

With schools and all other group learning events turning to virtual formats, there are numerous online resources that offer suggestions on how to make this transition successful, but the formal research supporting these suggestions is lacking. Virtual learning can take several forms, from passive, such as watching videos and listening to presentations, to active, including interactive games, real-time question–answer sessions, and use of individual virtual reality systems. Instruction can be synchronous or asynchronous. The use of social media platforms can incorporate any or all of these strategies. A systematic review of studies using social media for health promotion found that these platforms can be effective for education, and potentially for behavior change, on topics such as smoking cessation, diabetes, and health maintenance, although much more outcome data need to be evaluated (Balatsoukas et al., 2015). Covid-19 pandemic related research on the topic indicates that college-level students benefit from a combination of live and recorded presentations that are kept relatively short to maintain focus (Camargo et al., 2020). Furthermore, younger students may need additional support from parents/caregivers to maintain engagement and focus (Zhao et al., 2020). No research was found on best practices for virtual education of children ages 4–6. This effort to describe a pre-kindergarten safety program's change process from hands-on to virtual will add to that body of information (Table 1). With these facts in mind, strengths, limitations, and other insights from this project have been identified.

Strengths

In the summer of 2020, interactive hands-on pre-kindergarten safety education programs had to choose between cancelation and an abrupt change to a virtual format. While not ideal, the virtual option was determined to be better than not offering it at all. Since that time, this same organization

Table 1 Summary of pre-kindergarten educational program format transition

Needs assessment	What is happening? What needs to happen?	In-person pre-kindergarten injury prevention education has been canceled. Children still need to be introduced to this essential information
Planning	How can this education go on while adhering to pandemic guidelines?	Live, in-person group events are not allowed. Educational events have been successful via online platforms. This is a strategy to proceed with this important program
Implementation	What is the operational definition of the new format?	Videos and information shared via social media platforms; activity packets & bike helmets distributed to participants
Evaluation	Was the program successful in connecting children to this education?	Hundreds registered and participated
Lessons learned	How can we make it better the next time?	Longer planning period, more activities, live feedback/interaction, focus on engagement

has also gone virtual with car seat education and checks, which Kendi et al. (2020) have found to be an effective strategy. In addition to complying with state mandates to "flatten the curve" by halting group activities, other benefits emerged. Importantly, this virtual education was being viewed by siblings and parents along with the registered child. Parental involvement and education is related to improved early childhood learning, improved safety behaviors, and decreased childhood injuries (Ma et al., 2016; Kendrick et al., 2013, 2017). This involvement opens opportunities for discussion, as well as reinforcement of safety skills for parents and other children in the home. New information could be put to use immediately by doing a fire drill, asking parents to check fire alarms, or taking a walk around the neighborhood. Additionally, because the videos would be available indefinitely, it allowed for repetition of videos the children particularly enjoyed, or ones parents chose to replay to reinforce learning. Preschool children are known for watching favorite videos over and over until they have them memorized. This type of repetition has been shown to improve comprehension among pre-kindergarteners (Crawley et al., 1999). The "Safety City" videos averaged 278 views on Facebook alone (unable to get numbers from Instagram), excluding Fire Safety House which had 1500 views, and Police Cruiser which had 4000 views!

Another benefit was that lack of transportation was not a road-block to participation. In-person pre-kindergarten safety education programs require participants to be dropped off and picked up multiple days, during normal business hours. Transportation is a social determinant of health (NEJM Catalyst, 2017), which in this case, affects access to injury prevention education. While some people find ways to make it work, certainly there are some who do not even entertain the idea of their children participating because of a lack of transportation options. The virtual set-up took this out of the equation. Lack of transportation may have been one reason for the lower turn-out at packet pickup/helmet fitting events, but it did not preclude children from participating.

Limitations

The primary limitation of this version of pre-kindergarten safety education is that it's just not the same. These programs were purposefully designed to be an opportunity for children to safely begin to spend time away from parents/caregivers. This time is to be spent learning in a small group structured environment, which is supported as an effective training strategy for children (Schwebel et al., 2014), and is similar to what they would soon experience in kindergarten. Having miniature towns with streets, sidewalks, and train tracks allows children to safely make mistakes and learn from them; mistakes that in the real world could be deadly. It has been demonstrated that children learn safety behaviors well from this type of experiential learning (Lamb et al., 2006; Schwebel et al., 2016a, b). Watching videos does not provide that type of experience, although support is emerging that video games and virtual reality have a place in childhood safety training (Arbogast et al., 2014; Schwebel et al., 2016a, b).

Technical difficulties were another problem that came with making this safety education virtual. The organizers had intended to live-stream the first video as a welcome, but were not able. As a result, they had to hastily record the welcome, then upload it, making people who were online at the designated time wonder what was going on. It may have prompted some people to log off. There is also the concern about children without access to the internet being excluded from this important learning experience (Benda et al., 2020).

Insights for Future Programs

Given the spur-of-the-moment decision to do this, and the short planning period, hindsight finds that some different options may make the program more successful in the future. First, it would be better to start planning earlier in the year and expand publicity efforts to include more outlets, such as libraries, schools, or other online platforms. Some feedback indicated that interested families found out about the program after its conclusion. An earlier start would also allow time to seek grants or other sources of funding. Given appropriate time and funding, it may be better to send out the activity packets in advance so children can work on them during the designated safety education week instead of after the fact. Interactive live-streaming, using a platform such as Zoom, would be a closer approximation to the in-person programs, though possibly more complex to organize. Recordings of the livestream could still be uploaded for repeat or later viewing. Releasing videos every two hours may not keep children engaged, and may be tedious for parents to have to log in every two hours. Hourly might be more appropriate, especially with the activity packet to work on in between. Another option would be to release all of the day's videos at once each morning, along with instructions for caregivers about recommended viewing schedule and ideas for complementary activities. Finally, a wrap-up video with a virtual graduation and printable certificate would add to the sense of accomplishment and completion at the end of the event.

Conclusion

Many activities had to be adapted to minimize human interaction during the Covid-19 pandemic. We saw increases in everything from telehealth doctor visits to virtual tours for

prospective home buyers. A pre-kindergarten injury prevention program is one more activity amenable to this type of change. Childhood safety education cannot stop because of a pandemic. One organization, working with community safety partners, found a way to successfully connect children with important education that they otherwise would have missed during the summer of 2020. This experience may lead to a virtual version of this education being regularly offered, with future efforts building on this one.

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Data Availability Videos and information about the program remain publicly available on the Safe Kids Greater Toledo Facebook and Instagram pages.

Declarations

Conflict of interest As described above, the department that created this program is funded by grants and donations. No funding was sought specifically to fund this project, nor this program evaluation. The authors have no other financial disclosures or conflict of interest to report.

Ethical Approval This project was a quality initiative to replace important standard pre-kindergarten education that otherwise would have been canceled. Prior to seeking publication, the local IRB determined that the project is not considered human subjects research. No participant identifiers were collected or shared.

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